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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT
ENVIRONMENTAL CRITERIA AND ASSESSMENT OFFICE
CINCINNATI, OHIO 45268

NOV 09 1990

Subject: Toxicity Values (Pagel's Pit/Illinois)

From: Pei-Fung Hurst *P. F. Hurst*
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To: Bernard J. Schorle
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Thru: W. Bruce Peirano *W. Bruce Peirano*
Acting Chief
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This memo is in response to the request by your contractor, Mike Kierski of Warzyn Engineering, regarding the most recent and relevant information available to us regarding oral and dermal reference doses (RfD) and carcinogenicity slope factors for the list of chemicals provided. In the information that follows, not available indicates that criteria were not derived in a U.S. EPA document.

Please do not hesitate to contact me at FTS 684-7300 if I can be of further assistance.

Attachment

cc: C. DeRosa (ECAO-Cin)
M. Kierski (Warzyn Engineering)
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513-569-7300

Toxicity Values for Pagel's Pit

Aluminum

Oral RfD. Not available. The HEA (U.S. EPA, 1987) for aluminum considers the data base for aluminum inadequate for the derivation of an RfD.

Oral slope factor. Not available. A cancer classification of C was assigned to aluminum in the HEA (U.S. EPA, 1987), however, a slope factor was not calculated.

U.S. EPA. 1987. Health Effects Assessment for Aluminum. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH. For the Office of Solid Waste and Emergency Response, Washington, D.C.

Antimony

Oral RfD. Verified oral RfD of $4E-4$ mg/kg/day.

Oral slope factor. Not available.

Calcium

Oral RfD. Not available.

Oral slope factor. Not available.

Cobalt

Oral RfD. An interim oral RfD of $1E-5$ mg/kg/day has been calculated by the TSC and detailed information available upon request.

Oral slope factor. Not available.

Copper

Oral RfD. Not available. The current drinking water standard is 1.3 mg/L. The Drinking Water Criteria Document concluded that the toxicity data were inadequate for calculation of an RfD for copper (U.S. EPA, 1987).

Oral slope factor. Not available. The verified cancer classification for copper is D, thus data are inadequate for derivation of a cancer slope factor.

U.S. EPA. 1987. Drinking Water Criteria Document for Copper. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH for the Office of Emergency and Remedial Response, Washington D.C.

2,4-Dimethylphenol

Oral RfD. Verified oral RfD of $2E-2$ mg/kg/day, pending input onto IRIS.

Oral slope factor. Not available.

Iron

Oral RfD. Not available. The HEA (U.S. EPA, 1984) considered the database to be insufficient for the derivation of an RfD.

Oral slope factor. Not available.

U.S. EPA. 1984. Health Effects Assessment for Iron. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH. For the Office of Solid Waste and Emergency Response, Washington, D.C.

Lead

Oral RfD. Not available. It appears that some of the effects associated with lead exposures, particularly changes in the levels of certain blood enzymes and in aspects of children's neurobehavioral development, may occur at blood levels so low as to be essentially without a threshold. The Agency's RfD Work Group has discussed inorganic lead (and lead compounds) at two meetings and considered it inappropriate to develop RfDs and RfCs for inorganic lead. An Uptake/Biokinetic Model for lead has been developed by ECAO and we can run the model to predict blood levels and potential health effects if site specific values can be provided to us.

Oral slope factor. Not available. The CRAVE Work Group recommends that a numerical estimate not be used because quantifying lead's cancer risk involves many uncertainties, some of which may be unique to lead. Age, health, nutritional state, body burden, and exposure duration influence the absorption, release, and excretion of lead. It is also felt that current knowledge of lead pharmacokinetics indicates that an estimate derived by standard procedures would not truly describe the potential risk.

Magnesium

Oral RfD. Not available.

Oral slope factor. Not available.

Mercury

Oral RfD. Verified oral RfD for inorganic mercury of $3E-4$ mg/kg/day, this RfD is pending input onto IRIS. There is also a verified oral RfD for methyl mercury of $3E-4$ (mg/kg/day). The RfD for methyl mercury is currently being reconsidered by the RfD Work Group.

Oral slope factor. Not available. There is a verified cancer classification for mercury of D, thus the data are inadequate for the derivation of a cancer slope factor.

2-Methylphenol

Oral RfD. Not available.

Oral slope factor. Not available.

Potassium

Oral RfD. Not available.

Oral slope factor. Not available.

Silver

Oral RfD. Verified oral RfD of $3E-3$ mg/kg/day.

Oral slope factor. Not available. Verified cancer classification of D, thus data are inadequate for the derivation of a cancer slope factor.

Sodium

Oral RfD. Not available.

Oral slope factor. Not available.

1,1,2-Trichloroethane

Oral RfD. An oral RfD of $4E-3$ mg/kg/day is available on IRIS.

Oral slope factor. Group C Classification with an oral slope factor of $5.7E-2$ (mg/kg/day)⁻¹ available on IRIS.

Dermal Route of Exposure

Because toxicity values for dermal exposure are generally not available, current EPA methods specify that dermal toxicity values are to be extrapolated only from values derived for oral exposure. Adequate dermal toxicity data are sometimes available for carcinogenicity (e.g., skin painting studies). These studies can be used to support or oppose the appropriateness of route-to-route extrapolation, but there is currently no EPA method for using dermal data as the basis for a toxicity value. Since dermal exposure is expressed as an absorbed dose, oral toxicity values used for dermal risk assessment must also be expressed as an absorbed dose. Most oral toxicity values are expressed as administered doses and therefore will require absorption adjustment. Slope factors are adjusted to an absorbed dose by dividing by percent oral absorption, and reference doses are adjusted by multiplying by percent oral absorption.

Table 1. Oral Absorption Factors

Chemical	EPA Documents	ATSDR
Aluminum	HEA 1987 Animals: No data Humans: Some absorption	No ATSDR
Antimony	HEA 1987 Animals: 1-15% Humans: No data	No ATSDR
Arsenic	HEA 1984 Animals: 30-98% Humans: 60-95%	Animals: 30-75% Humans: 46-95%
Copper	DWCD 1987 Animals and Humans: Some absorption but not quantifiable	Animals: absorbed but not quantifiable Human: 15-97%
Iron	HEA 1984 Animals and Humans: 1-25% depending upon the presence of heme	No ATSDR
Lead	HEA 1984 Animals and Humans: absorbed but not quantifiable	No ATSDR
Inorganic Mercury	HEA 1984 Animals: <0.01% Humans: <15%	Animals: 15% Humans: 1-38%
Alkyl Mercury	HEA 1984 Animals: No data Humans: essentially complete absorption	Animals: 95% Humans: >80%

Chemical

EPA
Document

ATSDR

Silver

DWCD 1988
Animals: 1-3%
Humans: Absorbed
but not
quantifiable

No ATSDR

1,1,2-
Trichloroethane

HEA 1984
Animals and
Humans: Rapidly
absorbed by
analogy to
similar compounds

Animals: >81%
Humans: No data